

REMARKS

This is in response to the Office Action mailed on February 23, 2007. Claims 1-41 were pending in the application, and the Examiner rejected all claims. With this amendment, claims 1, 3, 12, 21, 29, 34, and 37 are amended, claims 2, 4-9, 31-33, and 41 are canceled, and the remaining claims are unchanged in the application.

In one embodiment, the present system detects speech in two ways. First, an acoustic microphone is used to detect acoustic signals provided during speech, and second, a non-acoustic detector is provided to detect the speech using non-acoustic ways, such as by detecting movement of a user's face, by detecting vibrations of various bones or other parts of the user's body, by detecting the temperature of a user's breath, etc.

In the embodiments set out in claim 1, a headset is claimed. The headset not only includes a head mount (which mounts the headset to the head of a user) but the headset has an audio microphone mechanically connected to it along with an in-ear transducer that is "positioned to be located inside a user's ear and mechanically connected to the head mount; and at least one earphone speaker mechanically connected to the head mount."

None of the references, either alone, or in combination, teach a headset that has not only an audio microphone connected to it, but both an in-ear transducer that generates an electric signal based on an input indicative of speech, and at least one ear phone speaker mechanically connected to it. In fact, none of the references either alone or in combination include an in-ear transducer that detects speech. This is simply not found in the references cited by the Examiner. While some of the references may teach a speaker located proximate a user's ear, they do not teach or suggest an in-ear transducer (such as an in-ear microphone) that senses an input indicative of speech, and generates an output electrical signal based on the sensed input. This is simply not found in any of the references cited by the Examiner. Therefore, Applicant submits that the headset claimed in claim 1 is allowable over the references cited by the Examiner.

Similarly, none of the references, either alone or in combination, teach that a speech recognition system can be supplied power based on whether a speaker is speaking. In

other words, as set out in the present specification, power requirements by current personal digital assistants (PDAs) should be carefully managed so that batteries powering such devices have the longest desirable lifetime, without recharging. By detecting whether a speaker is speaking, and only powering the speech recognition system when the speaker is speaking, the present system conserves power. For instance, in relatively loud environments, the speech recognition system may think that it is receiving a speech signal when, in fact, it is only receiving background noise. Therefore, the speech recognizer may be running at times when it does not need to run, thereby undesirably increasing power consumption. By only powering the speech recognition system when a speaker is speaking, this is avoided.

Specifically, independent 12 is drawn to a speech detection system that not only includes an audio microphone and a speech sensor, but a speech detector component configured to receive the sensor signal from the speech sensor and output a speech detection signal “and to control power to a speech recognizer based on the speech detection signal.” This is simply neither taught nor suggested, nor even mentioned, by any of the references cited by the Examiner. Therefore, Applicant submits that independent claim 12 is allowable.

Independent claim 21 is drawn to a method of detecting whether a user is speaking. The method includes providing a sensor signal indicative of sensed radiation reflected from the user’s face; detecting whether the user is speaking based on the sensor signal; and “controlling power to a speech recognizer based on whether the user is speaking.” Since none of the references either teach or suggest this type of system, Applicant submits that independent claim 21 is allowable over the references cited by the Examiner.

Independent claim 29 is drawn to a speech recognition system. The speech recognition system includes a speech detector system that has an audio microphone, “an in-ear speech sensor configured to sense vibration within a user’s ear and output a sensor signal indicative of the vibration”; a speech detector; a background speech removal component; and a speech recognition engine “the speech recognition engine being powered based on the sensor signal.” None of the references, either alone, or in combination, teach or suggest such a system that includes an in-ear speech sensor configured to sense vibrations within a user’s ear, a speech

detector that detects speech based on the sensor signal sensing vibrations, and a speech recognition engine “powered based on the speech detection signal.” These items are simply missing from the prior art cited by the Examiner. Therefore, Applicant submits that independent claim 29 is allowable over the references cited by the Examiner.

Independent claim 34 is drawn to an audio input system. The system includes “a headset including an audio microphone, a speaker and an in-ear sensor configured to sense vibration in a user’s ear and output a signal indicative of the vibration.” None of the references cited by the Examiner teach or suggest such a headset. In fact, it does not appear that any of the references even discuss an in-ear sensor, much less one that is part of a headset and that senses vibrations within a user’s ear. Therefore, Applicant submits that independent claim 34 is allowable.

Independent claim 37 is drawn to a speech recognition system that includes “a headset including an audio microphone outputting a microphone signal based on an audio input, and an in-ear speech sensor configured to sense a physical characteristic indicative of speech and output a sensor signal indicative of the sensed physical characteristic; and a speech recognition engine...”. Applicant respectfully submits that the prior art fails to teach or suggest the headset, with the in-ear speech sensor, and certainly fails to teach or suggest such a headset along with a speech recognition engine. Therefore, Applicant submits that independent claim 37 is allowable over the references cited by the Examiner.

In conclusion, Applicant submits that independent claims 1, 12, 21, 29, 34 and 37 are allowable. Applicant further submits that dependent claims 3, 10-11, 13-20, 22-28, 30, 34-36, and 38-40, which depend either directly or ultimately on the independent claims are allowable as well. Reconsideration and allowance of claims 1, 3, 10-30, and 34-40 are respectfully requested.

The Director is authorized to charge any fee deficiency required by this paper or credit any overpayment to Deposit Account No. 23-1123.

Respectfully submitted,

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